

WHAT IS CLAIMED IS:

1. A residual stress measuring system for measuring residual stress in an optical fiber, comprising:

5 a light source for generating light; a lens system for converting the generated light into a plane wave;

 a polarimeter for transforming the converted light to an input polarized light;

 a rotational measuring section for rotating the optical fiber to enable the polarized light to transmit through the optical fiber in various directions; and,

10 a detector for detecting the residual stress having an asymmetrical circular stress distribution based on a phase shift of the light transmitted through the optical fiber.

2. The system according to claim 1, further comprising at least one mirror for changing a path of the light generated from the light source.

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3. The system according to claim 1, wherein the rotational measuring section comprises:

 an optical fiber holding section including a slide glass and a cover glass for interposing the optical fiber therebetween;

20 a first jig for holding one end of the optical fiber; and,

 a motor for rotating the first jig holding the optical fiber.

4. The system according to claim 3, wherein the optical fiber holding section further comprises:

a second jig for holding the other end of the optical fiber; and,

a driving section for transmitting a rotating force from the motor to the first and

5 second jigs uniformly for rotation of the optical fiber.

5. The system according to claim 3, wherein an oil having a substantially similar refractive index of the optical fiber is applied between the slide glass and the cover glass.

10 6. The system according to claim 1, wherein the optical fiber holding section comprises:

a jig for holding one upper end of the optical fiber so as to rotate the optical fiber in a vertical orientation; and,

a cell, filled with an oil having a substantially similar reflective index of the fiber,

15 for causing the optical fiber to be positioned therein in a vertical orientation.

7. The system according to claim 6, wherein the oil has a enough viscosity to rotate the optical fiber without any stress applied to the optical fiber.